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EXAMINER				
ANDERSON, DENISE R				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/595,841

**Applicant(s)**

JOHNSON, WARREN THOMAS

**Examiner**

Denise R. Anderson

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.  
4a) Of the above claim(s) 23-33 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-22 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☒ Claim(s) 1-33 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 15 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SI/08)  
Paper No(s)/Mail Date 17 February 2009  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Election/Restrictions***

2. Applicant's election without traverse of claims 1-22 (Group I) in the reply filed on February 17, 2009 is acknowledged.

3. Claims 23-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on February 17, 2009.

#### ***Claim Rejections - 35 USC § 102***

4. Claims 1-12, 14, and 17-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Cote et al. (US Patent No. 5,607,593, Mar. 4, 1997).

5. Regarding claim 1, Cote et al. discloses aeration / backwash devices in a water-treatment installation with one or more membranes (membranes 3) vertically spaced between upper and lower headers. Cote et al., Abstract, line 1; Figures 1, 3, 5-8 and 10 showing membranes 3. There are two types of Cote et al. aeration / backwash devices. First, there is a wall 9 through which air from the air compressor 19 or permeate from backwashing pump 18, or both, are delivered from permeate recovery chamber 10 into the membrane modules 3 via the openings in the hollow fibers housed in sheaths 5. Cote et al., Figs. 1 and 8-7; col. 10, lines 1-19. In this case, applicant's aeration / backwash devices would be the Cote et al. hollow fibers with the

recited communication chamber being the hollow center of the hollow fibers and the recited through-openings that gas and liquid pass through being the hollow fiber pores.

6. The one remaining claim 1 limitation is taught by the second type of Cote et al. aeration / backwash device. Cote et al. discloses such devices in Figs. 1-2 and 5-11 as ozone (or O<sub>3</sub>) injection means 6 connected to an ozone supply network 15 "to serve as both a circulation fluid and an oxidizing fluid." Cote et al., col. 3, lines 27-28. Cote et al. further teaches, "The ozone could therefore be introduced into the installation according to the following three modes of implementation: in a gaseous monophasic form . . . in a biphasic form . . . in an aqueous monophasic form." Cote et al., col. 4, lines 33-44; Fig. 1 where the ozone is introduced as a gas, Fig. 7 where the ozone is introduced as a gas with water, and Fig. 8 where the ozone is introduced in saturated water form. Cote et al. further discloses three embodiments of the ozone injection means that correspond to the recited aeration/backwash device with a communication chamber and spaced-through holes for the introduction of gas or liquid. First, there is the tube shown in Fig. 6 where the ozone (O<sub>3</sub>) is introduced by ozone injection means 6. Second, there is the annular structure shown in Fig. 9 at the bottom of the membrane module 31 where the chamber is underneath the hood, with the small through-holes shown at the ends of the ozone supply means 15 and the large through holes shown as lower open-worked zone 8. Third, there is porous structure 16 through which ozone (O<sub>3</sub>) is introduced as shown in Fig. 10. The second embodiment shown in Fig. 9 is an example of applicant's recited "aeration/backwash device [that] is adapted to at least partially surround a portion of said membrane module" and "gas is supplied . . . through said through-openings to provide an even gas distribution for aerating the membranes." The even distribution comes from the symmetric placement of the small through-

holes shown at the ends of the ozone supply means 15 and the large through holes shown as lower open-worked zone 8. Cote et al., Fig. 9.

7. To summarize, Cote et al. anticipates all claim 1 limitations.

8. As an aside, it does not enter into the patentability analysis whether the liquid backwash provided to the aeration / backwash device is permeate or water to be treated because it has been held that, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). MPEP 2115 [R-2]. As long as Cotes et al. discloses an apparatus structure to deliver a gas or a liquid through the through-openings of the aeration/ backwash device, the prior art reads on the claim limitation. In this case, Cotes et al. discloses that both gas and liquid can be delivered to the through-openings in the hollow fiber aeration / backwash device and the ozone injection aeration / backwash devices.

9. Regarding claim 2, Cote et al. discloses an aeration/backwash device wherein the gas and liquid backwash are selectively communicated through the same through- openings. In other words, gas and liquid can be introduced "selectively" in time where gas is introduced first and then liquid or vice versa. For hollow fiber aeration / backwash devices, Cote et al. teaches, "The backwashing . . . starts with the permeate present in the chamber 10 . . . and ends by the penetration of air . . . at the end of the backwashing operation." Cote et al., col. 10, lines 9-26; Figures 1 and 7-8. For the ozone injection aeration / backwash devices, Cote et al. shows equipment set up to deliver a gas stream through ozone-supply means 22 and an air compressor

19 and liquid through pump 21a in Figs. 7 and 8, such that gas and liquid can be introduced selectively to ozone injection means 6.

10. Regarding claims 3-4, claim 3 recites the through-openings are vertically spaced and gas moves "through at least the upper of said through-openings" and liquid "is withdrawn . . . through the lower of said through-openings." Claim 4 recites liquid is fed "into the base of the module through the lower openings or both sets of openings." As was discussed in the claim 1 patentability analysis, Cote et al. discloses the apparatus in place to deliver gas and liquid to the hollow fiber aeration / backwash devices (Figs. 1, 7, and 8) and the ozone injection aeration / backwash devices in (Figs. 7 and 8). Cote et al. further teaches that the hollow fiber aeration / backwash devices have vertically spaced through-openings in the form of pores such that gas moves "through at least the upper of said through-openings" and liquid "is withdrawn . . . through the lower of the through-openings," as recited in claim 3. Cote et al. further teaches, in Figs. 1, 7, and 8, that liquid is fed "into the base of the module through the lower openings or both sets of openings" as recited in claim 4. Cote et al. also discloses vertically spaced through openings in the ozone-injection aeration / backwash device shown in Fig. 9 with small through-holes shown at the ends of the ozone supply means 15 and the large through-holes shown as lower open-worked zones. In Fig. 9, Cote et al. further teaches bubbles 11 and liquid moving "through at least the upper of said through-openings." As was discussed in the claim 1 patentability analysis, Cote et al. also teaches that ozone can be injected as a liquid (Fig. 8 and col. 4, lines 33-34 and 42) through the ozone network supply means 15 shown in Fig. 9. As such, Cote et al. discloses that liquid is fed "into the base of the module through the lower openings or both sets of openings" as recited in claim 4.

11. Regarding claim 5, Cote et al. discloses an apparatus in place such that "ozone injection means (applicant's aeration / backwash device) enabl[es] the creation of a current of water within said sheath" and thus discloses a device that can inject liquid "to sweep solids along membranes . . . during aeration" as recited.

12. Regarding claims 6-10, Cote et al. discloses an ozone injection aeration / backwash device in Fig. 9 at the bottom of the membrane module 31 and also hollow fiber aeration / backwash devices (fibers enclosed in membrane module 31) with the through-openings being the hollow fiber pores. Both types of devices were discussed in the claim 1 patentability analysis above. As was also discussed in the claim 1 patentability analysis, Cote et al. further teaches that both gas and liquid flow through these devices in Figs. 1, 7, and 8. The Cote et al. ozone injection device in Fig. 9 has small through-holes shown at the ends of the ozone supply means 15 and large through holes shown as lower open-worked zone 8. As such, Cote et al. discloses upper and lower through-openings [claim 6] through which liquid flows [claim 9]. The upper through-openings, i.e., the pores, of the hollow fiber devices are smaller than the lower through-openings of the ozone injection device [claim 7]. Cote et al. also discloses, in the Fig. 9 ozone injection device, through-openings axially displaced around the periphery of the chamber [claim 8] in the form of an annulus [claim 10].

13. To summarize, Cote et al. anticipates all limitations recited in claims 2-10.

14. Independent claim 11 recites claim 1 limitations in a different format. As such, the patentability analyses are analogous. Claim 11 further recites an upper and lower filtrate

collection chamber. Cotes et al. discloses an upper filtrate chamber in Figs. 10 and 11 and a lower filtrate collection chamber (permeate-recovery chamber 10) in Figs. 1 and 6-8.

15. To summarize, Cote et al. anticipates claim 11.

16. Dependent claim 12 recites claim 3 limitations and, as such, the patentability analyses are analogous. To summarize Cote et al. anticipates claim 12.

17. Dependent claim 14 recites that the aeration / backwash device is adjacent the lower header. Cote et al. discloses this for the hollow fiber aeration / backwash devices (membranes 3) in Figs. 5, 6, and 9-11. Cote et al. further teaches this for the ozone injection aeration / backwash devices shown in Fig. 6 (the tube where the ozone, O<sub>3</sub>, is introduced by ozone injection means 6), in Fig. 9 (the annular structure at the bottom of the membrane module 31 where the ozone, O<sub>3</sub>, is introduced through ozone supply means 15) and Fig. 10 (the porous structure 16 where ozone, O<sub>3</sub>, is introduced).

18. Dependent claims 17-22 recite various limitations on a screen surrounding the membranes. In Figs. 1-11, Cote et al. discloses a screen (sheath 5) at least partially surrounding the membranes [claim 17] (membranes 3) and at least partially extending along the membrane length [claim 18] in a membrane filtration module (filtration module 31). The Cote et al. screen (sheath 5) is solid [claim 19] and located above the ozone injection backwash / aeration devices [claim 20] as shown in Fig. 6 (the tube where the ozone, O<sub>3</sub>, is introduced by ozone injection means 6), in Fig. 9 (the annular structure at the bottom of the membrane module 31 where the ozone, O<sub>3</sub>, is introduced through ozone supply means 15) and in Fig. 10 (the porous structure 16 where ozone, O<sub>3</sub>, is introduced). In these same figures, Cote et al. further teaches that the screen



(sheath 5) extends the full length of the membrane module (membranes 3 in filtration module 31) with one or more openings (open-worked zones 8) adjacent the aeration / backwash device and additional openings (open-worked zones 8) at the top [claim 21]. Cote et al. also teaches that liquid moves through the screen openings [claim 22], i.e. the sheath holes, when Cote et al. discloses that "said sheaths hav[c] holes that enable the passage of water to be treated in said preferred direction of treatment." Cote et al., col. 3, lines 60-62.

19. To summarize, Cote et al. anticipates all limitations recited in dependent claims 12, 14, and 17-22.

#### ***Claim Rejections - 35 USC § 103***

20. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cote et. (US Patent No. 5,607,593, Mar. 4, 1997) as applied to claim 11 above, and further in view of Zha et al., (WO 03/013706 A1, Feb. 20, 2003 – which will be cited from the equivalent US Patent Pub. 2004/0217053 A1).

21. Claim 13 recites a filtrate collection pipe between the upper and lower filtrate collection chambers. Cote et al. discloses the claimed invention except for the filtrate collection pipe. In the Fig. 1 membrane module assembly, Zha et al. teaches that it is known to have a filtrate collection pipe between upper and lower filtrate collection chambers (permeate collection headers 9 and 10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included a filtrate collection pipe between the Cote et al. upper and lower filtrate collection chambers as taught by Zha et al., since Zha et al. states at ¶ 30, lines 8-10, that such a modification would allow "(f)iltrate / permeate [to be] removed from both ends

of the module 6 through ports 11 and 12 connected to headers 9 and 10 respectively," as opposed to just one end.

22. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cote et al. (US Patent No. 5,607,593, Mar. 4, 1997) as applied to claim 11 above, in further view of Watanabe et al. (WO 02/04101 A1, Jan. 17, 2002 – which will be cited from the equivalent US Patent Pub. 2004/0045893 A1).

23. Cote et al. discloses the claimed invention except for explicitly stating that the filtration module is detachable [claim 15] from the upper and lower collection chambers. Watanabe et al. teaches that the filtration module is detachable in Figs. 1, 4, 6 and 9-11 for “a hollow fiber membrane cartridge used in a filtration apparatus used for removing turbidity and bacteria from a large volume of raw water.” Watanabe et al., ¶ 1, lines 6-8. Referring to Fig. 6, Watanabe et al. further teaches, “The hollow fiber membrane cartridge of the present invention is inserted into the housing from above and fixed to the upper end of the housing head by means of the collar 12a of the cartridge through a gasket or an O-ring so as not to permit the passage of liquid either in or out. . . . The housing head 21b, the collar 12a and the cap 24 are integrally fixed by means of a housing nut 23.” Watanabe et al., ¶ 98. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the Cote et al. filtration module to be detachable as taught by Watanabe et al., since Watanabe et al. states at ¶ 98 that such a modification would allow the hollow fiber membrane cartridge to be inserted into the housing (applicant’s screen) and then detachably secured there by a fitting so that the liquid to be filtered would not bypass the membranes.

24. Cote et al., in view of Watanabe et al., discloses the claimed invention except for the bayonet-type fitting recited in claim 16. The Watanabe et al. fitting is shown in Figure 9 as a clamp 20 and in Figures 10-11 as a threaded housing nut 23. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Cote et al. filtration module, to have substituted a bayonet-type fitting for the clamp or threaded housing nut taught by Watanabe et al. because of the equivalence for their use in the fittings art – and the selection of any of these known equivalents to allow the hollow fiber membrane cartridge to first be inserted into the housing (applicant's screen) and then detachably secured there by a fitting so that the liquid to be filtered does not bypass the membranes, would be within the level of ordinary skill in the art.

#### ***Response to Arguments***

25. Applicant's arguments filed February 17, 2009 have been fully considered but they are not persuasive.

26. Applicant's arguments are directed to the newly recited limitation that "gas is supplied to the chamber and communicated through said through openings to provide an even distribution for aerating the membranes." Applicant's arguments are listed below with the examiner's response following each argument.

- a. Applicant argues, "No structure exists in Cote et al. that is adapted for maintaining an even distribution of the ozone that is emitted from the pipes of the distribution network 15. As can be seen in Fig. 9, this results in bubbles 11 which are not evenly

distributed around the fiber bundles as set forth in claim 1.” Applicant’s Remarks, p. 8, lines 24-27.

The examiner responds as in the above claim 11 patentability analysis. Cote et al. discloses three embodiments of the ozone injection means that correspond to the recited aeration/backwash device with a communication chamber and spaced-through holes for the introduction of gas or liquid. . . . Second, there is the annular structure shown in Fig. 9 at the bottom of the membrane module 31 where the chamber is underneath the hood, with the small through-holes shown at the ends of the ozone supply means 15 and the large through holes shown as lower open-worked zone 8. . . . The second embodiment shown in Fig. 9 is an example of applicant’s recited “aeration/backwash device [that] is adapted to at least partially surround a portion of said membrane module” and “gas is supplied . . . through said through-openings to provide an even gas distribution for aerating the membranes.” The even distribution comes from the symmetric placement of the small through-holes shown at the ends of the ozone supply means 15 and the large through holes shown as lower open-worked zone 8. Cote et al., Fig. 9.

- b. Applicant argues, “[T]he upper 18 and lower 19 through-openings of the current invention are arranged around the module circumference. . . . This arrangement results in gas being emitted in a direction perpendicular to the longitudinal axis of the fibers. . . . By contrast, the upstanding pipes in Cote et al., are oriented in a position parallel to the fiber bundles (See Fig. 9). . . . Therefore, the arrangement in Cote et al.

does not provide cross flow gas distribution relative to the fibers as in the current invention."

The examiner responds as in Point (a) above. Cote et al. discloses even a structure that provides even gas distribution for aerating the membranes, as recited.

A second response is also available, which follows. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the feature upon which applicant relies (i.e., gas emitted in a direction perpendicular to the longitudinal axis of the fibers) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### ***Conclusion***

27. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

28. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

31. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

/Walter D. Griffin/  
Supervisory Patent Examiner, Art Unit 1797